Division of Wildlife Refuges

Narrative Report Routing Slip

Refuge RUBY LAKE Year 1964

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RUBY LAKE NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

FOR 1964

UNITED STATES DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

BUREAU OF SPORT FISHERIES AND WILDLIFE

RUBY VALLEY, NEVADA

REFUGE PERSONNEL

Donald E. Lewis	Refuge Manager
Omer E. Larochelle	Asst. Refuge Manager
Carl H. Longenecker	Maintenanceman II
Virginia M. Lewis	(Intermittent) Clerk

Summer Temporary

Jack Lemback	Operator General (Light)
Rowland Williams	Laborer
Robert Bandfield	Laborer

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I. GENERAL

A. Weather Conditions

The early part of the year gave us extremes of temperature with January ranging from 61 to -20; the other first quarter months did similarly. A moderate amount of snow fell and precipitation was nearly normal. Winds were not of high velocity, but considerable miles accumulated.

Spring was characterized by slightly above-normal precipitation with an exceptionally long cool period that seemed reluctant to give up to summer.

Summer finally came and gave us a long dry period with little moisture and relatively high temperatures that persisted into early October when Fall came in.

Fall was very short and dry and ended abruptly with a wet storm the last few days of October that provided the only moisture for that month and ended an extremely dry period that had begun in mid-June.

By mid-November, early winter was upon us and we received several light snows accompanied by high gusty winds and temperatures that plunged to 14 below.

December ended the year with a flare by beginning and ending with substantial storms. The "Christmas Storm" dumped 1.83" of rain in one 24-hour period and was accompanied by 147 miles of wind that led us to re-read our instruments for this amount of wind and rain is almost unbelievable for Ruby. Winds reached gusts estimated at 80 m.p.h.; blew over two outhouses and tilted two garages. The three times normal precipitation of December let us end the year with 3.28" of moisture over normal.

The following chart summarizes data collected at the Refuge Weather Station:

PRECIPITATION

Month	Snowfall	This month	Normal	Max. Temp.	Min. Temp.	Evap.	Wind (miles)
Jan.	18.0	1.53	1.03	61	-20		1378
Febr.	4.0	.11	1.06	55	- 6		1205
March	21.0	1.17	1.61	66	- 4		1468
April	11.5	1.63	1.15	72	16		1442
May	7.0	2.22	1.14	81	22	4.82	1520
June	1.0	1.36	1.06	87	31	5.31	1009
July		Tr	.53	96	44	10.72	905
Aug.		.25	.49	94	30	9.23	1021
Sept.		.18	.72	85	27	6.40	951
Oct.		.89	1.20	84	18	3.47	728
Nov.	7.0	1.29	1.40	67	-14		1305
Dec.	12.5	5.62	1.58	58	2		2147
TOTAL	82.0	16.25	12.97	96	-20	39.95	15,079

B. Habitat Conditions

1. Water

1964 proved to be a normal water year, providing favorable spring flows that continued throughout the summer. It was not difficult to maintain controlled water levels near their optimums. The South and East Sumps benefited greatly from this continued source of water with good waterfowl production occurring for both ducks and geese. Waters in the South Sump raised to their highest level during recent years and waterfowl production exceeded all other portions of the refuge. Emergent and aquatic vegetation responded favorably and adequate food was available to raise broods to flight stage.

Good amounts of winter moisture are accumulating at both lower and higher elevations. In fact, they are above normal for this time of year, projecting at least a normal water year for 1965.

2. Food and Cover

Sufficient natural food provided by the aquatic habitat sustained waterfowl numbers throughout 1964. Extensive islands of pondweed almost completely vanished with concentrated use. Growths of emergent vegetation were not noted to change substantially.

The refuge cultivated grain was most popular during the fall migration; Mallards and Canada geese especially concentrating in good numbers. The upland vegetation responded to the normal water year showing good growths in all native grasses.

All in all this was a good year.

II. WILDLIFE

A. Migratory Birds

Annual total waterfowl use declined in 1964 from 5,106,154 to 3,939,386 days use, or approximately a 23% decrease. (See line graph) This decrease resulted from a reduced usage by ducks and coots. (See bar graph) Swans and geese increased only slightly. Mallards, American Widgeon, Pintail, Green-winged Teal, Shoveler, Redhead and Ruddy ducks showed appre-

ciable decreases mainly during the fall migration. These birds accounted for the loss of 1,166,768 days use. The extremely late fall could be a possible explanation. High temperatures prevailed until about November 1 with very little build-up in migrant birds. The waterfowl at this time were remaining farther north. A sub-zero period in November froze the marsh and pushed both the migrants on the refuge and the birds basking northward through the area within a very short duration.

We are very disappointed in reporting no Trumpeter Swan reproduction. Possibly the late spring, with snow recorded on June 17, discouraged their efforts. We know the exact muskrat houses used by two pair of successful Trumpeters the previous year. The houses were not re-built to their normal specifications. We plan to be artificial muskrats early in 1965, and provide good nest foundations at these sites. Aquatic muskrat building material will be used and the artificial house modeled as close as possible to that of the real muskrat.

1,700 to 2,000 Whistling Swans migrated through Ruby Valley December 17. Follow-up memo's were sent to Salton Sea, Merced and Sacramento NW Refuges for possible recordings of influx. Sacramento reported the only increase that occurred to the corresponding dates on December 23.

Waterfowl production data is revealed in the following chart. The slight decline in 1964 is again attributed to the late spring. Eight inches of snow fell the first week of May and sub-freezing temperatures followed. This weather fluctuation continued until mid-June.

TEN-YEAR WATERFOWL PRODUCTION DATA

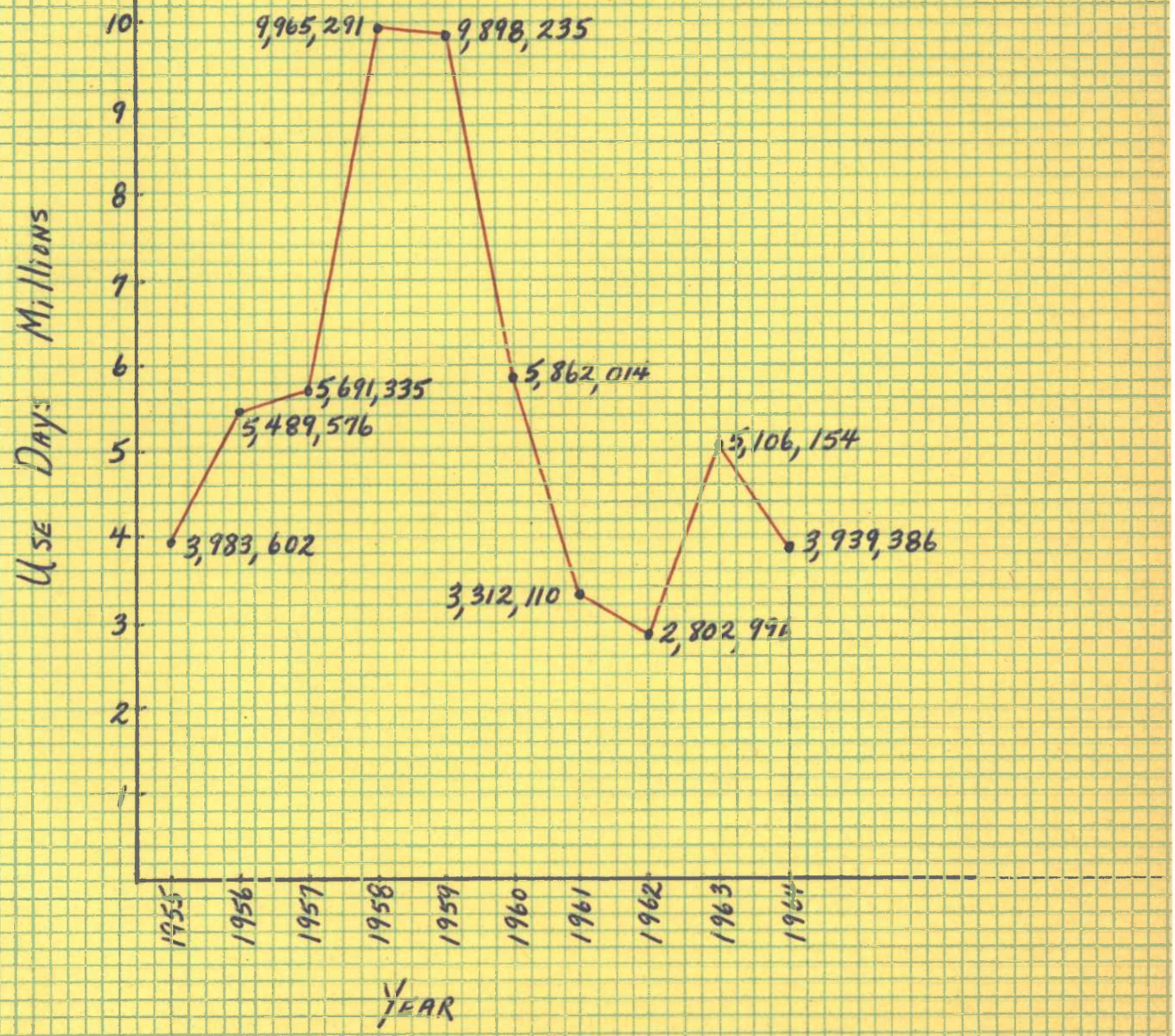
	Swan	Geese	Ducks	Coots	Total
1955	0	200	2,170	1,000	3,370
1956	0	400	1,960	1,000	3,360
1957	0	550	1,960	3,290	5,800
1958	6	322	2,302	3,870	6,500
1959	0	200	5,445	3,000	8,645
1960	3	292	5,430	6,500	12,225
1961	2	400	3,875	2,000	6,277
1962	0	350	1,300	2,500	4,150
1963	13	150	3,530	8,000	11,693
1964	0	130	3,300	6,000	9,430

The Mourning Dove Coo-count census was comparatively low due mainly to the lack of birds at the time of the count. Observations on the total summer and migrant populations revealed an increase. Trapping success is designated under Section V, Field Investigations and Applied Research.

The two graphs on the following pages compare total waterfowl days use for the past ten years and comparable 5-year use by species.

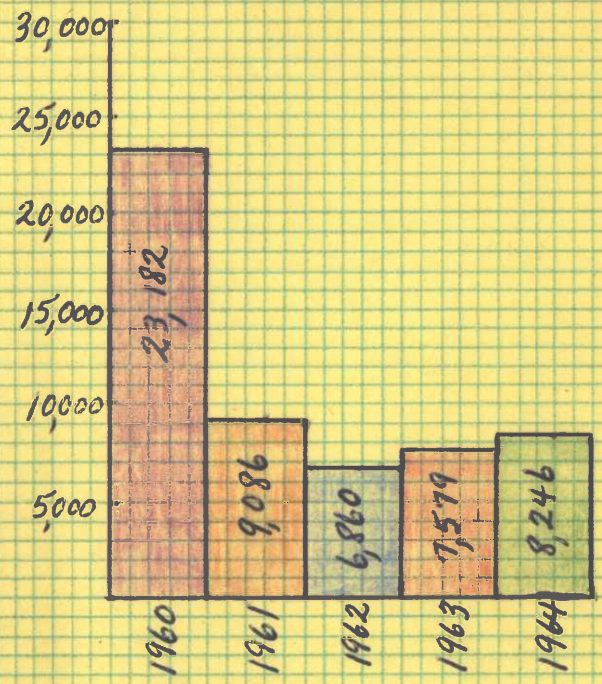
COMPARATIVE TEN-YEAR TOTAL WATERFOWL USE

January 1 to January 1

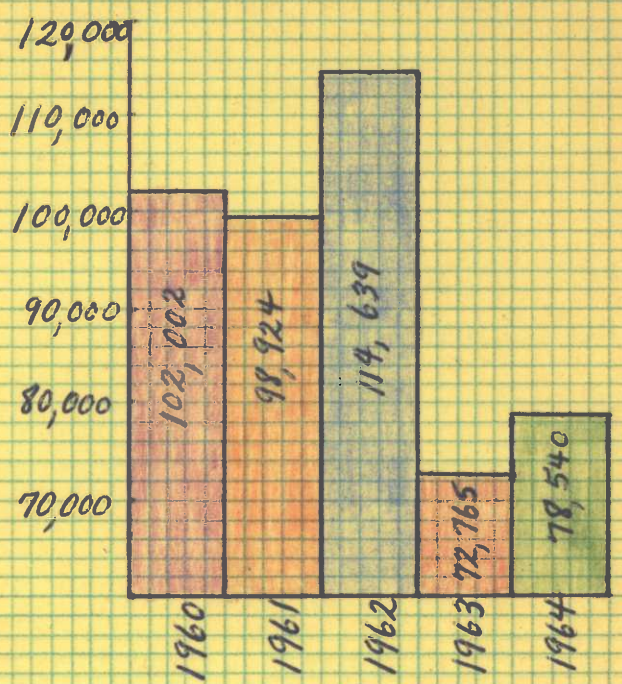


Comparative Use Days by Swans, Geese, Ducks and Coots

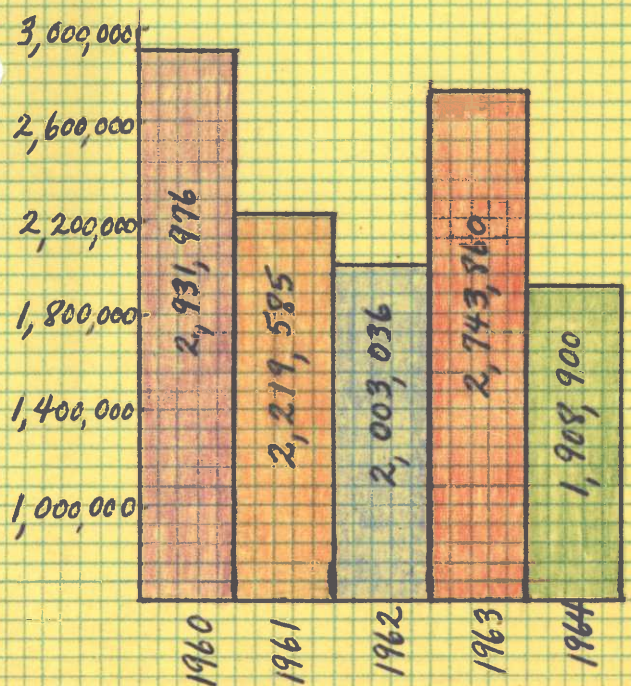
January 1 to January 1



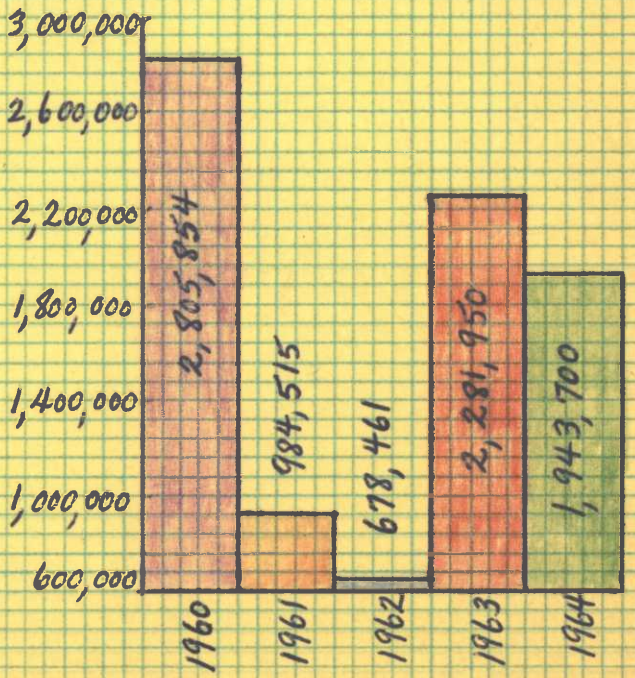
SWANS



GEESE



DUCKS



COOTS

B. Upland Game Birds

The four varieties of upland game birds, Sage Grouse, California Valley Quail and the two Partridges, Gray and Chukar, are all wintering well. Population figures for the first three species seem to coincide with those in 1963. The Chukar, however, has shown a representative increase and is now fairly common along the western boundary of the refuge. The California Quail have scattered from their release point and have been noted up to 18 miles from headquarters. About 35 Quail are presently enjoying the grain screenings handout at Quarters 17.

C. Big Game

A group of approximately 14 Mule Deer have been nightly visitors to the headquarters lawn since early September. It is believed that 6 fawns were born on the refuge. Observations indicate that the bulk of the Mule Deer herds have completed their annual treks to the wintering areas. It was not uncommon to see from 200 to 400 deer during evening drives. Their main wintering habitat lies to the south of refuge owned land. Concentrated hunting occurred in the Ruby Mountains, adjacent to the refuge with normal kills resulting.

D. Fur Animals, Predators, Rodents and Other Mammals

The 1963-64 trapping removals had little effect on the total Muskrat population. It appears that the surplus was gleaned leaving a reproductive population that bounced the number back to approximately that of last year. Muskrat recovery in the South Sump is now complete and proper management calls for the removal of the harvestable surplus during the regular trapping season. Additional Muskrat data is contained under the Section on Fur Harvest. Very few Beaver utilize the refuge. Coyotes were observed less frequently than last year. Their numbers correspond to good refuge management, because these fellows are welcome due to their beneficial effects on the Jack-rabbit population. Evidence in the winter's snow reveals that the Bobcat population is substantial. Mountain lion activity was at a minimum and curtailed in the higher elevations. Small numbers of Mink and Weasel are present near the State Fish Hatchery and along the collection ditch. Porcupine sign can be found in practically every small drainage along the western refuge boundary. Black-tailed Jackrabbits and Cottontail rabbits are considered to be within normal numbers. The Cottontail appears to have increased slightly.

E. Hawks, Eagles, Owls, Crows, Ravens and Magpies

Flushing observations on the Marsh Hawk indicate that Mr. Coot and Mr. Muskrat are, at least, occasionally taken for

dinner. Cooper's Hawks, Red-tailed Hawks and the Prairie Falcon all used the area for hunting purposes. The Turkey Vulture has two nightly roosting areas, one located in the aspen-cliffs along Cave Creek and the other in a rocky outcropping west of the boat landing. The headquarters site is by far the most popular with at least 60 members. The normal daily ritual consists of flying from the roost to the sunning posts on the boundary fence, drying in their characteristic open-winged sunning pose, soaring circular fashion in search of food and returning to the roost during the evening twilight. One pair of Golden Eagles put in their erratic presence, usually in the North Sump. No Bald Eagles were noted. One Prairie Falcon has been readily observed in the hay meadow between the State Fish Hatchery and headquarters.

Both the Short-eared Owl and the Great Horned Owl are common. They inhabit correspondingly different homesteads; the Short-eared prefers low marshy-meadow surroundings, while his bigger cousin enjoys the wooded draws and canyons in the foothills. Their combined hunting efforts tend to curtail the small rodent population.

Crows and Ravens were seen in fewer numbers this period, but the everpresent Magpie adjusted his numbers upward slightly.

F. Other Birds

The Refuge Manager continued the mist netting program initiated by Ass't Manager Larochelle in 1963. The program is designed to sample migrant perching birds during both the spring and fall. Data for 1964 is listed under Section V.

340 Yellow-headed Blackbirds and 128 Brown-headed Cowbirds were banded in conjunction with the Mourning Dove program. The American Redstart and the Lark Sparrow were added to the Refuge Bird List.

G. **Fish**

Sub-zero weather (-2) introduced the opening of the 1964 fishing season on January 12. Freeze-up problems were experienced by at least 50 fishermen. The Trout success was above average and most of the hardy anglers enjoyed themselves. As warmer weather prevailed, Trout and Bass fishermen increased their enthusiastic pace. Good catches of both were recorded, the largest fish in each category being as 8½ pound German Brown and a 5¼ pound Largemouth.

Bass conditions in the South Sump have improved considerable. Fair catches of Bass were obtained from boats during the period June to September. Factors that will contribute to continued good success in the South Sump are: (a) good water conditions without winter kill (b) Bass reproduction, and (c) sufficient numbers harvested.

Bass cooperative seining operations were conducted in June of 1964. Nevada State Fish and Game personnel obtained these fish for transplantation to suitable waters in the remainder of the state. This project has been conducted since the summer of 1959 and the data should be summarized. More information must be obtained before this summary can be completely accomplished. The following chart depicts some of the available material:

Date	No. transplanted	Size	Areas receiving Bass
1959	6,280	7"-8 "	Lyon, Churchill, Washoe, Elko, Pershing and White Pine Counties
1960	3,200	1 3/4"-9 "	Western Nevada Counties
1961	8,566	5½"-13"	Suitable waters throughout the State
1962	4,659	6"-7 "	Revive public fishing areas throughout the State and Stillwater Refuge
1963	5,087	3"-12"	Rye Patch Reservoir and Stillwater Refuge
1964	3,225?	3"-10"	No information
TOTAL	31,017		

Bass tagging operations are listed under Section V.

Trout planted in refuge waters during 1964 were:

Date	Species	Number	Average Size	Pounds
1/29	Kokanee*	800	½"- 1"	¼
3/16	Rainbow	3,600	8 "- 9"	1,000
4/7	Rainbow	3,800	8 "- 9"	1,000
5/11	Rainbow	3,106	9 "-10"	1,002
5/26	Brook	336	8 "- 9"	84
5/26	Rainbow	336	8 "- 9"	84
5/26	Brown	336	8 "- 9"	84
6/10	Rainbow	1,566	8 "- 9"	376
7/7	Rainbow	600	7 "- 8"	120
7/15	Rainbow**	200	7 "- 8"	34
9/25	Rainbow	3,077	8 "- 9"	669
9/28	Brown	976	16 "-17"	488
9/28	Brown	2,232	16 "-17"	1,116
10/5	Rainbow	2,600	8 "- 9"	650
10/15	Rainbow	900	7 "- 8"	150
	TOTAL	24,465		6,857¼

*Fish truck ran off road and the fish were dying. In order to save them they were planted in Cave Creek.

**Centennial tags. The removed jaw tags from these fish were sent to Carson City by lucky fishermen for a prize drawing, and extra incentive on the Centennial Day Celebration.

H. Reptiles

Fence lizzards and non-poisonous snakes were commonly seen. The rattlesnakes, however, were not as common as in 1963.

I. Disease

An early spring mortality was noted in the Coot population that was not attributed to disease. Early migrants were confronted with a frozen marsh and a late, heavy snow storm. It is believed that most of the birds died of malnutrition.

Eleven deaths to range cattle occurred from a type of respiratory disease that retards the absorption of oxygen in the lungs and the animals slowly suffocate. The animals succumbed within a week after movement from extremely dry feed onto greener pastures.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

1. The experimental rejuvenation of Unit 21 has survived the

first growing season with the following results. The dozed piles and windrows of flooded peat show no signs of Hardstem bulrush re-growth. This is rather surprising, in that the tubers and seeds for re-growth are present and water soaked. A thorough search for new shoots has revealed nothing. We are not positive what has happened. Has the water or soil changed during the disturbance? Further study will be conducted. Photo stations have been designated to record vegetative changes in future years. All in all, waterfowl use has significantly increased.

2. Spring-head Development Program.
No work of this type has been accomplished since the creation of Ruby Lake Refuge. For many years cattle have trampled existing springs and siltation run-off has, in some cases, completely covered these valuable water sources. A complete spring-head survey has been conducted, revealing 136 sources of water. Approximately 90 remaining spring-heads and their channels to the marsh need renovation. The project commenced in 1963 with 6 springs receiving treatment with the tire-mounted Michigan Dragline. Twenty-seven were cleaned in 1964. The resulting piles of silt will be worked to grade, planted to crested-wheat grass and fenced to protect spring sources from livestock trampling.

3. In order to acquire proper distribution of permittee cattle and utilize range land furthest from the marsh, it was necessary to drill three wells as sources of livestock water. Each well will be furnished with a windmill and suitable tanking. The wells are in and the windmills purchased at the present time. The remainder of the project will be completed by June 1965.

Drilling particulars are in the chart below:

	Well No. 1	Well No. 2	Well No. 3
Casing	6"	6"	6"
Depth of Well	64'	73'	65'
Standing Water from surface	10'	29'	10'
Perforated Casing	12' to 64'	47' to 70'	41' to 65'
Soil Types	Clay and Sand	Gray gravel & Water gravel	Silt, Clay, Sand

4. Three major graveling projects were accomplished in 1964. (a) Re-shaping and graveling access road and dike roads around Unit 21--484 loads, 2420 yds. (b) Graveling and re-shaping access road and boat landing--229 loads, 1,145 yds. (c) Building, shaping and graveling access road to Diving Board Pond

and North Hatchery Ponds--334 loads, 1,670 yds. Nevada State Hatchery personnel were recruited as truck drivers.

A D-4 Loader was rented from the local Soil Conservation District at a reasonable price, $5.00/hr. Grand total for the three jobs required 1,047 loads comprising about 5,235 yards of gravel.

5. New water line.
The domestic water supply to Quarters 18, 46 and the schoolhouse was completely re-done. Five hundred sixty feet of 1½" water line was laid at a minimum of 3' below the surface. Risers, stop and waste valves and three fire hose boxes containing 100' of fire hose are presently in the construction stage. Previously, fire protection was lacking. The old line, buried to a depth of 6" in places and above the surface for approximately 90' where it crossed Cave Creek, developed into a real headache at -20 degrees.

Other maintenance projects either accomplished or in progress are as follows:

1. Periodic grading of all dikes and roads.
2. Replacement of storm windows and doors on Quarters 8, 17 and 46 with aluminum combination screen-storm windows and doors.
3. Purchased and installed new oil-fired, forced-air furnace in Quarters 8 and buried 516 gallon tank.
4. Completed Boat Landing picnic area including fencing, cattle guard, toilet and graveled parking--plus deepening boat launching area and furnishing boat ties.
5. Replaced front steps of Quarters 8 and 17 and repaired "CCC" building steps.
6. Refinished four refuge directional signs, one boundary sign and entirely constructed a new directional sign.
7. Mowed and irrigated headquarters lawn, hauled garbage, maintained appearance of area.
8. Regular maintenance of all vehicles and equipment.
9. Salvaged wind destroyed "CCC" camp garage--piled and burned unsalvable remains.
10. Mowed all dikes and roadsides, sprayed with herbicidals as necessary
11. Installed electric gas and diesel tank fuel pumps and constructed concrete apron for same. It sure is a pleasant relief "gasoline without hand pumping".
12. Conducted regular fire drills, SAFETY meetings, regularly inspected all extinguishers and fire fighting equipment.
13. Set up two outdoor toilets near Bressman cabin.
14. Maintained boundary and interior fencing.
15. Activated 1½ sack cement mixer acquired from surplus.

16. Mounted newly acquired TD-14A blade and activated hydraulic system.
17. Placed new cattleguard at entrance to North Hatchery Ponds.
18. Constructed stock pond at north end of refuge.
19. Bladed equipment-access trails to three windmill well sites.
20. Replenished wood supply for the shop stove.
21. Cleaned and maintained collection ditch, culverts and water control structures.
22. Constructed winch boom for 4X4 power wagon.
23. Weeds were cleaned from approximately 1,300 feet of collection ditch with the Michigan Dragline.
24. Construction of rock jacks and picnic area fence.
25. Removed South Boundary and Minnow signs from old road, refinished both and placed them along the new road.
26. Re-painted the flagpole.
27. Repaired domestic water line Quarters 8.

B. Plantings

1. Aquatic and Marsh Plants

None.

2. Trees and Shrubs

None.

3. Upland Herbaceous Plantings

None.

4. Cultivated Crops

This year we switched all of our grain plantings for the benefit of waterfowl from Henchen Barley to Common Rye; 85 acres were planted. Common Rye is more economical to raise.

C. Collections and Receipts

1. Seeds or Other Propagules

Five thousand eight hundred pounds of Common Rye seed were purchased locally to be seeded for waterfowl use.

Six thousand and sixty pounds of elevator screenings were bought ($40/ton) to be used as bait in Dove and waterfowl banding operations. This has proven an excellent and economical bait.

2. Specimens

None.

D. Control of Vegetation

All dikes and roadsides were sprayed with an application of 2 lbs/acre of 2-4-D amine to control broadleaf vegetation. A week later the mower was used on these areas, as well as headquarters, to further control weedy vegetation.

E. Planned Burning

The North and East Sumps were burned in early November to remove extremely dense growths of Hardstem bulrush. The temporary openings are readily utilized by waterfowl. Also, broods tend to use these created openings to advantage while feeding.

F. Fires

No fires occurred on the refuge and refuge personnel were not called upon to assist on other fires.

IV. RESOURCE MANAGEMENT

A. Grazing

Four active grazing permits were again in effect this year: Orieal Saxton (11 horses), Walter Gardner (413 mixed cattle), Raymond Gardner (276 mixed cattle, 24 horses) and the Duval Ranching Co. with (657 mixed cattle and 4 horses).

A total of 6,589 AUM's were used by these permittees for a return of $10,016.80. About one-half of the annual forage was used which left the range in good condition.

B. Haying

The Duval Ranching Company annually mow and buck three irrigated wild hay meadows. Small amounts of hay are stacked as security in case of early snows. The remainder of the bucked hay is left to dry and is later consumed more thoroughly by grazing livestock.

C. Fur Harvest

Mr. Jack Lemback, our only trapper, had removed 1,056 muskrats from the diked units on December 31. Most of the rats are

taken within 150 yds. of the dikes or in the dikes themselves. This type of trapping reduces the dike dwellers and alleviates damage. Jack is working on a quota of 3,000 muskrats, most of which will be harvested from the developed units.

D. Timber Removal

None.

E. Commercial Fishing

None.

F. Other Uses

None.

V. FIELD INVESTIGATIONS OR APPLIED RESEARCH

A. Coot Investigation

Late spring snows and a freeze-up concentrated early migrating Coot on small open spring-heads and moving water, providing a watched-for opportunity to bait trap.

Four funnel traps were moved to the State Hatchery area where approximately 2,000 Coot were concentrated. Trapping commenced March 24 using mixed grain bait and continued for 76 trap days resulting in 599 banded Coot. Traps were most effective when placed on dry land facing open water or on land trails connecting open water. A high of 103 Coot were banded on March 3.

B. Hydrologic Investigation

Mr. William Dudley spent his third summer here gathering field data on the hydrology of the Ruby Mountains. He has furnished valuable information concerning our proposed spring-head development program which is now operational.

Following are his remarks regarding waters tributary to Ruby Lake:

> "Most of the water available to Ruby Lake Refuge comes from precipitation within the basin, which includes Ruby Valley south of Harrison Pass, the east flank of the Ruby Mountains and the west flank of the Maverick Springs Range. The contribution of the last is, of course, very small.

In addition to this water, some seems to be gained by interbasin flow through cavernous limestone and dolomite strata from Huntington Valley drainage on the west side of the Ruby Mountains. The Soil Conservation Service in Elko has estimated that 10,000 acre-feet per year is lost in this way, most of it to Ruby Valley.

Transportation of water into the Refuge area occurs in a number of ways. Moisture falling beneath the 6,000-foot contour either lands directly in the lake or gets there shortly by surface runoff. Only occasional surface runoff during spring thaws and exceptional storms reaches Ruby Lake from above the 6,000-foot contour. Most of the water available to Ruby Lake occurs as discharge from springs fed by that portion of the precipitation in the Ruby Range which finds its way into the ground-water system.

This ground-water system seems to be rather complex in the Rubys. Apparent perched water is channeled eastward along the direction of dip of the permeable rock strata, emerging at high-level and low-temperature springs such as Cave Spring at the Refuge Headquarters and Flynn Spring at Shanty Town. Much of this discharge again seeps into the alluvium at the base of the range. Leakage downward from these more permeable strata replenishes the "permanent" water table beneath the range.

This permanent ground-water system of the Ruby basin should resemble those in other drainage basins feeding permanent lakes or streams. These are characterized by ground-water mounds or ridges having divides which agree closely with overlying topographic divides. Thus, ground-water basins usually coincide almost exactly with surface-water basins, and the subsurface water moves slowly down gradient from the outer edges of the basin to discharge in the central lake or stream. There can be little doubt that the low-level springs bordering Ruby Lake are intersections of this permanent water table with topographic lows. The point of spring discharge must be the point of lowest head for the immediately surrounding area. The ground beneath is saturated and under a higher water pressure. It follows, then, that no water can be lost downward by opening these springs.

The flow of many of these springs will be increased somewhat by the dredging program, although the water gained at one site will be lost to a spring closer to or beneath the lake. The main advantage of the program, in my opinion, is that a greater portion of the total spring

flow can be captured and channeled into beneficial use rather than lost to evaporation and transpiration at the spring sites. Under no reasonably foreseeable circumstances can there be any net loss of water, and the available water will certainly be made more manageable."

C. Muskrat Investigation

After a lapse of nine years, this study has been resumed. Population studies and other data are being collected. Total body length, sex, weight and age (both by external features and from the preserved hides) plus house counts by the trapper, are adding to muskrat knowledge. Population densities, and their location in the marsh with records on harvest intensity by units, are other factors under study.

D. Waterfowl Banding

Pre-season waterfowl banding commenced with the activation of two funnel type traps in the South Sump on August 28, 1964. These two traps were effective mainly on Pintails, and produced the quota in 36 trap days.

Two funnel type traps were activated in the springhead below headquarters on September 8, 1964. These two traps were effective mainly on Mallards, and the quota was reached in 30 trap days.

All waterfowl occurring in the traps were banded. The following chart summarizes the results:

Species	Number banded
Mallard	500
Pintail	584
Green-winged Teal	5
Redhead	10
Coot	24
TOTAL	1,123

E. Dove Banding

The Mourning Dove banding program was initiated on May 12 at the Fort Ruby Ranch sheep corrals. Dove concentrations never numbered more than approximately 150 birds. Sixteen funnel type dove traps, each containing two entrances, were used. There seemed to be a significant difference in the catch in relation to trap pattern. If the traps were scattered singly the result was poor; a tight rectangular formation proved the most promising. Dove concentrations

diminished by June 26 and the traps were inactivated. 774 doves were trapped and banded in 46 days. 81 additional doves were trapped from August 28 to September 20. The grand total: 855 doves in 70 days.

F. Seeding Trials - Standard Soil Survey

Three experimental grass plots using various treatments were developed to determine suitabilities of five species of grass recommended by the local Soil Conservation Service agent, who furnished the seed. The five species were Alkar Tall Wheatgrass, Birdsfoot Treefoil, Basin Wildrye, Alkali Sacaton and Russian Wildrye. Results are incomplete and will be recorded later .

These trials are in conjunction with a cooperative Standard Soil Survey to be conducted on 19,000 acres of the refuge during the 1965 field season. This soil survey will also furnish range site and condition information, all of which will serve as a sound basis for a comprehensive Soil and Moisture Program.

G. Passerine Bird Banding

A total of 494 passerines were banded during spring migration. Yellow-headed and Brewer's Blackbirds along with Brown-headed Cowbirds were trapped and banded incidental to Dove banding between May 13 and June 8.

In addition, Manager Lewis carried out a mist-netting program and banded the following species:

Species	No. Banded
Yellow-headed Blackbird	340
Brown-headed Cowbird	128
Brewer's Blackbird	6
Black-headed Grosbeak	2
Evening Grosbeak	2
Wilson's Warbler	1
Yellow Warbler	1
Audubon Warbler	1
Olive-sided Flycatcher	1
Empidonax Flycatcher	4
Pine Siskin	2
Western Tanager	4
American Redstart	1
House Sparrow	1
TOTAL	494

H. Bass Tagging

A bass tagging program to determine age-growth and fisherman return of harvestable-sized bass (over 9") was initiated by Mr. Donald King, Fishery Management Biologist.

Two technicians from Nevada Fish and Game, as well as the Refuge Manager and Assistant, also worked on this project.

A total of 177 bass were tagged between June 6 and September 28, most of which were seined though a small number were captured using an experimental AC-DC electro-fishing device being tested by Mr. Braden Pillow, Fishery Management Biologist from Portland. Refuge personnel, also, used rod and reel to capture and tag bass on evenings and weekends; Manager Lewis took by far the greatest number this way.

Though sportsmen placed many tags in return boxes provided, preliminary information will not be available for at least one more fishing season.

VI. PUBLIC RELATIONS

A. Recreational Use

Annual recreational use increased only about 6%. The increase was mainly attributed to the movement of recreationists from Wild Horse Reservoir, drained for dam repairs, to the refuge to fish and water ski. The late spring snow storms retarded visitor use by closing the short route over the pass and renduring other access roads practically impassable. Fishing produced the most activity with 8,000 visitor days. Out-of-staters were recorded from Utah, Idaho and California. Improved water conditions in the South Sump attracted a small increase through boating and water skiing. The main attraction, however, proved to be the improved Largemouth fishery.

B. Refuge Visitors

We are proud to present the following list of official visitors:

VISITOR REGISTER

W-3
C.Y. 1964

DATE	NAME	ADDRESS Street	City	State
1-13-64	Dick Hall - Predator and Rodent Control	Wells, Nevada		
2-4-64	Leonard Hoskins - District Superintendent, Nev. Fish & Game	Elko, Nevada		
2-4-64	Dave Buck - Mgr., State Fish Hatchery	Ruby Valley, Nevada		
4-6-64	Warren Archer - Soil Conservation Service	Elko, Nevada		
4-16-64	Ray Glahn - Pilot Biologist	Portland, Oregon		
4-22-64	Tom Turner - Soil Conservation Service	Wells, Nevada		
5-9-64	Robert Watson - Mgr., Stillwater NW Refuge	Fallon, Nevada		
5-22-64	Norman Brown - U. S. Forest Service	Elko, Nevada		
6-2&3-64	Donald King - Fishery Mgt. Biologist	Reno, Nevada		
6-2&3-64	Bob Sumner - State Fish & Game	Reno, Nevada		
6-2&3-64	Bill Nisbet - Nevada Fish & Game	Elko, Nevada		
6-2&3-64	Patrick Coffin - Nevada Fish & Game	Elko, Nevada		
6-9-64	Bill Nisbet - Nevada Fish & Game	Elko, Nevada		
6-9-64	Donald King - Fishery Mgt. Biologist	Reno, Nevada		
6-9-64	Bob Sumner - Nevada Fish & Game	Reno, Nevada		
6-9-64	Braden Pillow - Fishery Mgt. Biologist	Portland, Oregon		

VISITOR REGISTER

W-3
C.Y. 1964

DATE	NAME	ADDRESS Street	City	State
6-18-64	District Supervisor, Slim Hanson - U. S. Forest Service	Elko, Nevada		
7-8-64	Tom Turner - Soil Conservation Service	Wells, Nevada		
7-9to15	Donald King - Fishery Mgt. Biologist	Reno, Nevada		
7-14&15	Patrick Coffin - Nevada Fish & Game	Elko, Nevada		
7-17-64	Vic Oglesby - Nevada Fish & Game	Reno, Nevada		
8-17-64	Roland Willden - U. S. Geological Survey	Lakewood, Colorado		
8-24-64	William Dudley - Desert Research Institute	Reno, Nevada		
8-20-64	Ray Glahn - Pilot Biologist	Portland, Oregon		
8-25-64	Manes Barton - Soil Conservation Service	Reno, Nevada		
8-25-64	Thomas Murphy - Soil Conservation Service	Elko, Nevada		
8-27-64	Glenn Bradley - U. S. Forest Service	Wells, Nevada		
9-3-64	Ray Glahn - Pilot Biologist	Portland, Oregon		
10-2-64	Tom Turner - Soil Conservation Service	Wells, Nevada		
10-4-64	Aquatic Habitat Clark Webster & Mrs. - Specialist	Washington, D.C.		
10-4-64	David Marshall - Wildlife Mgt. Biologist	Portland, Oregon		
9-25-64	Pank Defendorf - Quarters Evaluator	Portland, Oregon		

VISITOR REGISTER

W-3
C.Y. _____

DATE	NAME	ADDRESS Street	City	State
10-23-64	James Birch - Law Conservation	Reno, Nevada		
12-18-64	Osmon J. Ramsey - Bureau Land Mgt.	Elko, Nevada		
	Numerous visits by Nevada State Fish and Game personnel and Special Use permittees.			

C. Refuge Participation

Lewis - Attended regular monthly Elko County Game Board meetings.

Lewis - Attended local Ruby Valley Soil Conservation meetings.

Lewis - A slide talk on refuge activities and wildlife to the Elko Jaycees'.

Lewis - Met with the Elko County Commissioners to discuss road conditions on Harrison Pass

Lewis - Presented slide program and talk to Bureau of Land Management personnel, Elko, on refuge development and operations.

Lewis - Forest Service meeting on Harrison Pass road in Elko.

Lewis - Talked with Tom Turner, Soil Conservation Service agent, on Standard Soil Survey and vegetative map.

Lewis - Met with Elko Sportsman's Club president to obtain two surplus toilets.

Lewis - Presented wildlife slide program to the Businessman's Sportsman Dinner, Elko.

Lewis - Wildlife slide program to Forest Service employees and members of other interested government agencies in Elko.

Lewis - Attended the Elko District Wildlife Meeting held at the Bureau of Land Management office.

Lewis - Presentations of checks, representing 25% of the refuge receipts, to the Elko and Ely County Commissioners.

Larochelle - Presented 26 films for scheduled showings at the two Ruby Valley Schools. Hatchery and Refuge families attended the get-to-gether at the Cave Creek School.

Larochelle - 4-H Leader at Ruby Valley 4-H Club meetings.

Lewis and Larochelle - Attended Knoll Creek Experiment Station Field Day.

Lewis, Larochelle and Longenecker - Answered questions on refuge management at the Wells Rod and Gun Club meeting, plus slide presentation.

D. Hunting

Hunter use increased from 250 visitor days in 1963 to 400 in 1964. The total pressure, however, is considered very low. Only 12 hunters were recorded on opening day, and about half of these individuals were State Hatchery and Refuge employees. Two hundred two birds were bagged for 283 hunter hours or 1.40 birds per hunter hour. Hunters kill by species composition is recorded below:

Canada Geese	4
Mallard	112
Pintail	30
Gadwall	32
Green-winged Teal	8
Cinnamon Teal	3
Widgeon	9
Scaup	3
Wood Duck	1
Total	202

E. Violations

Refuge law enforcement resulted in the apprehension of the following violators:

Clifford M. Tilley Elko, Nevada	Fishing-closed waters	Warning
Douglas L. Goodale Elko, Nevada	Fishing-closed waters	Warning
Leroy Bylund Elko, Nevada	Shooting Doves from vehicle	$50.00
Merle Guldager Elko, Nevada	Shooting Doves from vehicle	$50.00
Darrel Weeks Wells, Nevada	Fishing-closed waters	$50.00
Clifford J. Letarti Carson City, Nevada	Fishing-closed waters	$50.00
Reginald C. Colby Concord, California	Hunting Deer-Illegal Hours	$150.00

VII. OTHER ITEMS

A. Items of Interest

The lost time accident record for Ruby Lake is now 3882 days.

Excellent cooperation was experienced between the Elko Sportsman's Club and the Refuge during 1964. They have contributed to refuge operation in three categories:

1. Material for ten picnic tables was purchased and assembled.
2. A 40' floating boat dock was a gift to the new boat landing.
3. Two toilets were donated with more in the wind.

Credit is due Mr. Larochelle, Mrs. Lewis and the Refuge Manager for the preparation of this report.

B. Photographs

The following photographs were taken during the regular course of refuge activities.

SIGNATURE PAGE

Submitted by:

Donald E. Lewis
(Signature)

Refuge Manager
(Title)

Date: January 15, 1965

Approved, Regional Office:

Date: 2-19-65

H. Nelson Elliott
(Signature)

Acting
Chief, Division of Wildlife
(Title)

NR forms for months of January to April, 1964

3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE Ruby Lake MONTHS OF January TO April, 1964

(1) Species	(2) Weeks of reporting period 12/29-1/4 (1)	1/5-11 (2)	1/12-18 (3)	1/19-25 (4)	1/26-2/1 (5)	2/2-8 (6)	2/9-15 (7)	2/16-22 (8)	2/23-29 (9)	3/1-7 (10)
Swans:										
Whistling						10	10	30	25	20
Trumpeter	15	15	15	21	21	18	21	21	21	21
Geese:										
Canada	290	50	50	20	20	40	40	100	400	250
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard	1900	1400	800	300	300	400	300	500	600	500
Black										
Gadwall	200	100	50	50	50	50	50	75	100	75
Baldpate	550	75	75	50	50	75	75	100	200	150
Pintail	1700	1300	750	200	250	300	300	400	500	600
Green-winged teal	200	50	50	50	50	75	100	100	100	100
Blue-winged teal										
Cinnamon teal										
Shoveler	175	50	50	20	50	75	50	75	100	75
Wood										
Redhead	400	75	50	20	20	100	120	150	250	150
Ring-necked	165	25	25	20	20	50	50	100	100	250
Canvasback	200				20	20			100	100
Scaup Lesser	165	50	50	50	50	50	50	100	100	150
Goldeneye Common	80	50	50	50	100	100	75		75	170
Bufflehead	350	50	50	20	50	50	50	50	75	130
Ruddy	300	50	25	20	50	75	75	100	100	
Other Common Merg.	10	10	10			10				
Red B. & Hooded Merg.					10			10	10	20
TOTAL DUCKS	6395	3285	2035	850	1070	1430	1295	1760	2410	2470
Coot:	2000	400	300	300	300	400	300	500	600	600

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Ruby Lake MONTHS OF January TO April, 1964

(1) Species	(2) Weeks of reporting period: 3/8-14 (11)	3/15-21 (12)	3/22-28 (13)	3/29-4/4 (14)	4/5-11 (15)	4/12-18 (16)	4/19-25 (17)	4/26-5/2 (18)	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:						Aerial					
Whistling	40	40	50						1,575		
Trumpeter	21	20	20	20	20	20	20	20	2,450		
Geese:											
Canada	350	400	400	400	400	250	200	200	27,020		
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Ducks:											
Mallard	400	400	400	400	450	900	900	900	82,250		
Black											
Gadwall	75	75	100	150	200	90	90	100	11,760		
Baldpate	150	150	150	200	250	175	200	200	20,125		
Pintail	350	350	400	400	450	275	300	300	63,875		
Green-winged teal	100	150	150	200	250	400	400	400	20,475		
Blue-winged teal						20	20	20	420		
Cinnamon teal				200	300	75	100	130	5,635		
Shoveler	100	75	75	150	150	300	300	300	15,190		
Wood											
Redhead	150	100	100	300	400	800	800	800	33,495		
Ring-necked	200	150	150	150	250	50	50	20	12,775		
Canvasback	150	150	150	200	200	900	900	900	27,930		
Scaup Lesser	150	100	100	100	200	100	100	90	12,285		
Goldeneye Common	150	100	100	50	100	50	40	30	9,590		
Bufflehead	150	100	150	100	130	20	40	50	11,270		
Ruddy	100	100	150	150	160	150	150	140	13,265		
Other Common Merg.					10		10	10	490		
Red B. & Hooded Merg.	10	10	10	10		10	10	20	910		
TOTAL DUCKS	2235	2010	2185	2760	3500	4315	4410	4410	341,775		
	800	1000	1800	6000	8500	9000	9500	9500	362,600		
Coot:											

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	4,025	70	0
Geese	27,020	400	0
Ducks	341,775	6,395	0
Coots	362,600	9,500	0

SUMMARY

Principal feeding areas Developed units, and goose grazing on upland slopes.

Principal nesting areas Islands in developed units and surrounding emergent vegetation.

Reported by O. E. Larochelle

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Ruby Lake Months of January to April 1964

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Great Blue Heron	Year Long	Resident	30	4/10						60
American Bittern	" "	"	20	4/10	Still Present					40
Sandhill Crane	4	3/12	20	4/15	"	"				100
Black-crowned Night Heron	20	3/15	70	4/20	"	"				100
Snowy Egret	5	3/25	80	4/20	"	"				200
White-faced Ibis	8	4/15	30	4/25	"	"				50
Pied-billed Grebe	2	3/15	20	4/25	"	"				50
II. Shorebirds, Gulls and Terns:										
Spotted Sandpiper	2	4/16	100	4/20	Still Present					200
American Avocet	7	4/3	30	4/20	"	"				50
Killdeer	2	2/26	75	4/20	"	"				150
Common Snipe	Year Long	Resident	50	4/20						100
Long-billed Curlew	1	4/7	25	4/15	"	"				50
Black-necked Stilt	1	4/7	10	4/15	"	"				20
Forster's Tern	3	4/25	10	4/30	"	"				10
Western Willet	2	4/7	15	4/20	"	"				30
California Gull	1	4/7	30	4/20	"	"				70
Lesser Yellowlegs	4	4/16	10	4/30	"	"				25

(over)

(1)	(2)		(3)		(4)		(5)	(6)
III. Doves and Pigeons:								
Mourning dove	2	4/16	250	4/30	Still	Present		400
White-winged dove								
Cooper's Hawk	Year Long	Resident	4	4/10				10
IV. Predaceous Birds:								
Golden eagle	" "	"	2	2/10				4
Duck hawk								
Horned owl (Great)	" "	"	6	2/15				20
Magpie	" "	"	200	1/10				400
Raven	" "	"	40	1/15				100
Crow	10	2/15	50	3/20	Still	Present		100
Sparrow Hawk	1	4/16	15	4/25	"	"		30
Bald Eagle	2	1/10	2	1/10	2	1/10		2
Turkey Vulture	1	3/18	60	4/23	Still	Present		80
Marsh Hawk	Year Long	Resident	20	3/20				50
Rough-legged Hawk	2	2/10	6	3/20	Still	Present		8
Red-tailed Hawk	Year Long	Resident	4	3/15				6
Sharp-shinned Hawk	" "	"	3	3/20				6

Reported by Donald E. Lewis

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

36104

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Ruby Lake Months of January to April, 1964

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Sage Grouse	Upland sage and rabbit brush, 20,000 acres	1000	0	0	0	0	0	0	200	On and off use
California Quail	Mountain drainages 75 acres	3	0	0	0	0	0	0	25	Natural spread from state plantings
Chukar Partridge	Mountain foothills 4000 acres	400	0	0	0	0	0	0	10	Natural spread from state plantings
Gray Partridge	Mountain foothills 8000 acres	400	0	0	0	0	0	0	25	Natural buildup of numbers

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge Ruby Lake Year ending April 30, 1964

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs						(5)
								Share Trapping						
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator * Control	For Re-stocking	For Re-search	Permit Number	Trappers Share	Refuge share	Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	Total Population
Muskrat	Marshland 12,000	2		2600				T-6637	1968	632	632	0	0	6000
Mink	Marshland 2,000	200												10
Coyote	Upland & Marshland 36,000	900			27									40
Bobcat	Upland 27,000	2700												10

* List removals by Predator Animal Hunter

REMARKS:

Reported by Donald E. Lewis, Refuge Manager

INSTRUCTIONS

Form NR-4 - SMALL MAMMALS (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

(1) SPECIES: Use correct common name. Example: Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.)

(2) DENSITY: Applies particularly to those species considered in removal programs. Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottom land hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) REMOVALS: Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headingslisted.

(4) DISPOSITION OF FUR: On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprimeness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided.

(5) TOTAL POPULATION: Estimated total population of each species reported on as of April 30.

REMARKS: Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

116007

NR Forms for months of May to August, 1964

3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE Ruby Lake MONTHS OF May TO August, 1964

(1) Species	(2) Weeks of reporting period: 5/3-5/9 (1)	5/10-16 (2)	5/17-23 (3)	5/24-30 (4)	5/31-6/6 (5)	6/7-13 (6)	6/14-20 (7)	6/21-27 (8)	6/28-7/4 (9)	7/5-11 (10)
Swans:						Aerial				
Whistling										
Trumpeter	18	12	12	12	12	12	12	12	12	12
Geese:										
Canada	200	200	200	200	200	200	200	200	200	200
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard	900	900	900	900	900	800	800	800	800	800
Black										
Gadwall	200	300	300	300	300	300	300	300	350	350
Baldpate	200	200	200	200	200	200	200	250	275	275
Pintail	300	300	300	300	300	300	300	250	250	200
Green-winged teal	400	400	400	300	300	250	250	200	200	200
Blue-winged teal	40	20	20	20	40	40	40	40	40	40
Cinnamon teal	250	300	400	400	400	400	400	400	440	440
Shoveler	300	300	350	350	350	300	300	200	220	200
Wood										
Redhead	800	800	850	850	850	1,000	1,000	1,000	1,000	1,000
Ring-necked	50	30	50	20	20					
Canvasback	900	900	900	900	900	800	800	800	800	800
Scaup Lesser	200	300	200	200	200	200	200	300	300	300
Goldeneye Common	40	20								
Bufflehead	150	100	100	150	150	150	200	150	150	150
Ruddy	150	150	150	200	300	300	300	250	250	250
Other Hooded Merganser	10	10	10	10		10				10
Total Ducks:	4,890	5,030	5,130	5,100	5,210	5,050	5,090	4,940	5,075	5,015
Coot:	9,500	10,000	10,500	12,000	12,500	12,500	13,000	13,000	13,500	13,500

INT.-DUP., D.C.-53824-59

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Ruby Lake MONTHS OF May TO August, 1964

(1) Species	(2) Weeks of reporting period 7/12-18 (11)	7/19-25 (12)	7/26-8/1 (13)	8/2-8 (14)	8/9-15 (15)	8/16-22 (16)	8/23-29 (17)	8/30-9/5 (18)	(3) Estimated waterfowl days use	(4) Production Broods seen	(4) Production Estimated total
Swans:	Aerial										
Whistling											
Trumpeter	12	12	12	12	12	12	12	13	1,561	0	0
Geese:											
Canada	200	200	225	275	300	300	300	250	28,350	18	130
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Ducks:											
Mallard	600	600	600	600	600	1,000	1,200	1,800	108,500	12	1,100
Black											
Gadwall	350	350	350	350	350	450	450	800	45,150	4	100
Baldpate	275	275	300	300	300	300	300	300	31,850	0	0
Pintail	200	200	200	400	600	1,000	1,800	3,000	71,400	3	100
Green-winged teal	200	200	200	200	200	600	450	1,200	43,050	0	0
Blue-winged teal	40	40	50	50	50	50	50	50	5,040	0	50
Cinnamon teal	450	450	500	500	500	500	500	400	53,410	8	500
Shoveler	175	175	175	175	175	175	250	175	30,415	0	50
Wood											
Redhead	1,000	1,000	1,100	1,200	1,200	1,100	1,100	800	123,550	5	300
Ring-necked									1,190	0	0
Canvasback	800	800	900	1,000	1,110	1,000	1,000	350	108,220	19	800
Scaup Lesser	300	300	300	300	300	300	300	300	33,600	0	0
Goldeneye									420	0	0
Bufflehead	150	150	100	150	150	150	150	150	18,200	0	0
Ruddy	250	250	300	350	400	400	400	400	35,350	3	300
Other Hooded Merganser									420	0	0
Total Ducks:	4,790	4,790	5,075	5,575	5,935	7,025	7,950	9,725	709,765	55	3,300
Coot:	14,000	14,000	14,500	15,000	16,000	15,000	14,000	12,000	1,441,500	23	6,000

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	1,561	13	0
Geese	28,350	300	130
Ducks	709,765	9,725	3,300
Coots	1,441,500	16,000	6,000

SUMMARY

Principal feeding areas: Diked units and South Sump.

Principal nesting areas: Islands in diked units and South Sump.

Reported by: Donald E. Lewis

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Ruby Lake Months of May to August 1964

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Great Blue Heron	Previous	Period	40	6/10	Still	Present	0	0	0	80
American Bittern	"	"	20	6/10	"	"	0	0	0	50
Sandhill Crane	"	"	20	8/25	"	"	0	5	9	30
Black-crowned Night Heron	"	"	30	6/10	"	"	0	0	0	100
Snowy Egret	"	"	90	7/15	"	"	0	0	0	150
White-faced Ibis	"	"	30	7/15	"	"	0	0	0	60
Pied-billed Grebe	"	"	100	8/20	"	"	1	40	100	200
Eared Grebe	"	"	40	8/20	"	"	1	60	100	200
Double-creseted Cormorant	"	"	2	7/10	2	7/10	0	0	0	4
II. Shorebirds, Gulls and Terns:										
Pelican (White)	6	5/23	6	5/23	6	5/23	0	0	0	0
American Avocet	Previous	Period	50	8/20	Still	Present	0	20	40	75
Killdeer	"	"	100	8/25	"	"	0	50	100	300
Common Snipe	"	"	25	6/30	"	"	0	10	30	50
Long Billed Curlew	"	"	110	6/10	"	"	1	30	60	150
Black-necked Stilt	"	"	10	6/10	"	"	0	0	0	20
Forsters Tern	"	"	15	7/20	"	"	0	0	0	30
Black Tern	"	"	20	7/20	"	"	0	0	0	40
Willet	"	"	25	7/20	"	"	0	30	60	80
California Gull	"	"	10	8/20	"	"	0	0	0	20
Spotted Sandpiper	"	"	50	8/2	"	"	0	20	40	100

(over)

(1)	(2)		(3)		(4)		(5)			(6)
III. Doves and Pigeons:										
Mourning dove	Previous	Period	250	6/20	Still	Present	0	100	200	400
White-winged dove										
IV. Predaceous Birds:										
Golden eagle	Previous	Period	2	5/1	Still	Present	0	0	0	2
Duck hawk										
Horned owl	Year	Round	4	5/1	"	"	0	0	0	10
Magpie	"	"	200	5/15	"	"	—	100	200	400
Raven	"	"	5	5/20	"	"	—	4	10	50
Crow	"	"	100	5/20	"	"	—	4	20	150
Sparrow Hawk	Previous	Period	20	7/10	"	"	0	0	0	40
Turkey Vulture	"	"	80	7/15	"	"	0	0	0	100
Coopers Hawk	"	"	6	5/10	"	"	0	0	0	8
Red-tailed Hawk	"	"	2	5/10	"	"	0	0	0	6
Prairie Falcon	1	5/12	2	7/20	"	"	0	0	0	2
Marsh Hawk	Previous	Period	30	7/20	"	"	0	0	0	40
Short-eared Owl	"	"	25	8/1	"	"	0	0	0	30

Reported by Donald E. Lewis

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

36104

3-1750b
Form NR-1B
(Rev. Nov. 1957)

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Ruby Lake For 12-month period ending August 31, 19 64

Reported by Donald E. Lewis Title Refuge Manager

(1) Area or Unit Designation	(2) Habitat Type	(2) Habitat Acreage	(3)	(3) Use-days	(4) Breeding Population	(5) Production
North Sump I	Crops	0	Ducks	9,000	700	300
	Upland	10,000	Geese	5,350	80	30
	Marsh	4,000	Swans	61	0	0
	Water	0*	Coots	191,500	500	500
	Total	14,000	Total	205,911	1,280	830
Developed Units II	Crops	45	Ducks	250,000	1,300	1,000
	Upland	3,000	Geese	20,000	100	90
	Marsh	2,700	Swans	1,000	10	0
	Water	0*	Coots	750,000	7,000	3,000
	Total	5,745	Total	1,021,000	8,410	4,090
South Sump III	Crops	40	Ducks	450,765	3,000	2,000
	Upland	10,048	Geese	3,000	20	10
	Marsh	9,200	Swans	500	2	0
	Water	0*	Coots	500,000	5,000	2,500
	Total	19,288	Total	954,265	8,022	4,510
Total	Crops	85	Ducks	709,765	5,000	3,300
	Upland	23,048	Geese	28,350	200	130
	Marsh	15,900	Swans	1,561	12	0
	Water	0*	Coots	1,441,500	12,500	6,000
	Total	39,033	Total	2,181,176	17,712	9,430
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
*All Water Areas included in Marshland	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			

(over)

INSTRUCTIONS

All tabulated information should be based on the best available techniques for obtaining these data. Estimates having no foundation in fact must be omitted. Refuge grand totals for all categories should be provided in the spaces below the last unit tabulation. Additional forms should be used if the number of units reported upon exceeds the capacity of one page. This report embraces the preceding 12-month period, NOT the fiscal or calendar year, and is submitted annually with the May-August Narrative Report.

(1) **Area or Unit:** A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should equal the total refuge area. A detailed map and accompanying verbal description of the habitat types of each unit should be forwarded with the initial report for each refuge, and thereafter need only be submitted to report changes in unit boundaries or their descriptions.

(2) **Habitat:** Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.

(3) **Use-days:** Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form NR-1.

(4) **Breeding Population:** An estimate of the total breeding population of each category of birds for each area or unit.

(5) **Production:** Estimated total number of young raised to flight age.

Interior Duplicating Section, Washington, D. C. 27580

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Ruby Lake Months of May to August, 19 64

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Sage Grouse	Upland, Sage & Rabbitbrush 26,333 Acres	1,315	10	70	2 hen ::1 rooster	0	0	0	200	Daily observations
California Valley Quail	"	2,630	10	60	1 :: 1	0	0	0	100	Daily observations
Gray Partridge	"	—	0	10	1 :: 1	0	0	0	25	Daily observations

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

NR Forms for months of September to December, 1964

3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE Ruby Lake MONTHS OF September TO December, 1964

(1) Species	(2) Weeks of reporting period 1	2	3	4	5	6	7	8	Aerial (State) 9	Aerial (Glahn) 10
	9/6-12	9/13-19	9/20-26	9/27-10/3	10/4-10	10/11-17	10/18-24	10/25-31	11/1-7	11/8-14
Swans:										
Whistling			10				20	20	20	
Trumpeter	13	13	13	13	14	14	14	14	14	14
Geese:										
Canada	250	250	200	275	325	400	400	400	310	300
Cackling										
Brant										
White-fronted										
Snow										10
Blue										
OtherTotal Geese	250	250	200	275	325	400	400	400	310	310
Ducks:										
Mallard	1,900	2,000	2,000	2,000	2,000	2,000	2,000	2,700	1,200	1,100
Black										
Gadwall	800	800	1,000	1,000	1,000	1,000	1,100	1,300	1,300	1,000
Baldpate	300	400	500	500	500	700	1,000	1,200	2,400	2,200
Pintail	3,000	3,100	3,100	3,200	3,200	3,200	3,200	4,900	800	600
Green-winged teal	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,350	250	150
Blue-winged teal	50	50	50	50	50	75	75	50	50	50
Cinnamon teal	400	400	400	400	400	400	400	300	100	0
Shoveler	175	200	250	300	300	300	200	800	400	250
Wood										
Redhead	800	800	800	800	800	800	800	1,600	1,900	1,700
Ring-necked									100	150
Canvasback	350	400	500	600	600	600	600	750	2,800	2,600
Scaup Lesser	300	300	300	300	300	375	375	300	300	350
Goldeneye										10
Bufflehead	150	150	200	200	250	250	300	300	250	250
Ruddy	400	400	400	400	400	400	400	500	190	200
OtherComm. Merganser									50	
TOTAL DUCKS	9,825	10,200	10,700	10,950	11,000	11,300	11,650	16,050	12,090	10,610
Coot:	12,000	12,000	12,000	13,000	13,000	13,000	13,000	12,500	18,000	15,000

Int. Dup. Sec.,
Wash.. D. C. 37944

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Ruby Lake MONTHS OF September TO December, 1964

(1) Species	(2) Weeks of reporting period 11/15-21: 11	11/22-28: 12	11/29-12/5: 13	12/6-12: 14	12/13-19: 15	12/20-26: 16	12/27-1/2-65: 17	18	(3) Estimated waterfowl days use	(4) Production Broods seen	Estimated total
Swans:											
Whistling	40				2,000*	40			1,050		
Trumpeter	14	14	14	14	14	14	10		1,610		
Geese:											
Canada	50	25	25	10	10	10	10		22,750		
Cackling											
Brant											
White-fronted											
Snow	10	10							210		
Blue											
Other TOTAL GEESE	60	35	25	10	10	10	10		22,960		
Ducks:											
Mallard	500	300	300	250	200	150	125		145,075		
Black											
Gadwall		150	150	150	100	100	50		77,000		
Baldpate	250	150	150	150	100	75	75		74,550		
Pintail	200	150	150	150	75	75	50		204,050		
Green-winged teal	100	75	75	75	50	50	25		74,200		
Blue-winged teal	50	10	10	10			10		4,480		
Cinnamon teal									22,400		
Shoveler	50	25	25	25	25	50	25		23,800		
Wood				25					175		
Redhead	150	100	100	100	25	25	10		79,170		
Ring-necked	75	100	100	100	50	25	25		5,075		
Canvasback	100	25	25	25					69,825		
Scaup Lesser	50	50	50	50	50	25	50		24,675		
Goldeneye	75	150	100	100	50	75	75		4,445		
Bufflehead	50	75	100	100	50	25	10		18,970		
Ruddy	50	75	100	100	50	25	25		28,805		
Other Comm. Merganser		10					10		490		
Hooded Merganser			25						175		
TOTAL DUCKS	1,700	1,445	1,460	1,410	825	700	565		857,360		
Coot:	3,000	1,000	800	500	300	300	200		139,600		

(over)

*Non-stopping migrants December 17, 1964

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	2,660	40	
Geese	22,960	400	
Ducks	857,360	16,050	
Coots	139,600	18,000	

SUMMARY

Principal feeding areas Entire refuge during open water. Collection ditch and spring heads after freeze-up, all refuge crops consumed.

Principal nesting areas

Reported by O. E. Larochelle

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Ruby Lake Months of September to December 1964

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Great Blue Heron	Previous	Period	150	10-20	Still	Present				
American Bittern	"	"	100	9-15	2	11-10				
Sandhill Crane	"	"	10	10-20	10	10-20				
Black-crowned Night Heron	"	"	80	9-15	Still	Present				
Snowy Egret	"	"	120	9-30	5	10-25				
White-faced Ibis	"	"	50	9-15	12	10-25				
Pied-billed Grebe	"	"	100	10-25	Still	Present				
Eared Grebe	"	"	20	10-15	5	10-20				
II. Shorebirds, Gulls and Terns:										
Pelican (white)	Previous	Period	0	0	0	0				
American Avocet	"	"	50	9-15	5	9-25				
Killdeer	"	"	150	10-15	20	11-5				
Common Snipe	"	"	20	9-20	Still	Present				
Long-billed Curlew	"	"	20	9-10	20	9-10				
Black-necked Stilt	"	"	5	9-10	5	9-10				
Forster's Tern	"	"	10	9-20	10	9-20				
Black Tern	"	"	20	9-9	20	9-9				
Willet (Western)	"	"	10	9-20	2	10-10				
California Gull	"	"	20	10-15	2	11-10				
Spotted Sandpiper	"	"	50	9-10	50	9-10				

(over)

(1)	(2)		(3)		(4)		(5)	(6)
III. Doves and Pigeons:								
Mourning dove	Previous	Period	200	10-20	10	11-15		
White-winged dove								
IV. Predaceous Birds:								
Golden eagle	Previous	Period	2	12-20	Still	Present		
Duck hawk								
Horned owl	Year	Round	6	12-20	"	"		
Magpie	"	"	200	11-15	"	"		
Raven	"	"	10	11-15	"	"		
Crow	"	"	200	10-15	"	"		
Rough-legged Hawk	2	10-15	6	12-23				
Sparrow Hawk	Previous	Period	5	10-20	5	10-20		
Turkey Vulture	"	"	80	9-15	2	10-26		
Cooper's Hawk	"	"	6	9-15	Still	Present		
Red-tailed Hawk	"	"	4	10-25	"	"		
Prairie Falcon	"	"	2	11-30	"	"		
Marsh Hawk	"	"	30	12-20	"	"		
Short-eared Owl	"	"	20	9-20	"	"		

Reported by Donald E. Lewis

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

36104

3-1750c
Form NR-1C
(Sept. 1960)

WATERFOWL HUNTER KILL SURVEY

Refuge Ruby Lake

Year 1964

(1) Weeks of Hunting	(2) No. Hunters Checked	(3) Hunter Hours	(4) Waterfowl Species and Nos. of Each Bagged	(5) Total Bagged	(6) Crippling Loss	(7) Total Kill	(8) Est. No. of Hunters	(9) Est. Total Kill
10/10-16	12	42	Mallard 29, Pintail 11, Gadwall 7, Green-winged Teal 6, Cinnamon Teal 3, Baldpate 3, Canada Goose 3	62	3	65	50	273
10/16-22	8	28	Mallard 9, Pintail 4, Gadwall 4, Baldpate 2	19	1	20	30	140
10/22-28	4	14	Mallard 11, Gadwall 3, Widgeon 2, Pintail 1	17	0	17	40	34
10/29-11/4	4	14	Mallard 7, Gadwall 1	8	0	8	40	16
11/5-11	5	18	Mallard 5, Pintail 3, Green-winged Teal 2	10	0	10	30	20
11/12-18	5	18	Mallard 12, Pintail 7, Gadwall 5	24	0	24	20	48
11/19-25	6	21	Mallard 9, Gadwall 4, Scaup 3	16	0	16	30	10
11/26-12/5	6	21	Mallard 6, Pintail 1	7	0	7	40	9
12/6-12	6	21	Mallard 8, Pintail 3, Gadwall 1	12	0	12	20	16
12/13-19	6	21	Mallard 5, Wood Duck 1, Canada Goose 1	7	3	10	30	13
12/20-26	13	55	Mallard 11, Gadwall 7, Baldpate 2	20	0	20	30	12
12/27-1/2/65	1	3	None	0	0	0	20	0
1/2-7	2	7	None	0	0	0	20	0
TOTAL	78	283		202	7	209	400	591

Duck season - October 10-December 23, 1964
Goose season - October 10, 1964-January 7, 1965

(over)

INSTRUCTIONS

(1) The first week of hunting begins with opening day and ends at the close of hunting 6 days later. Successive weeks follow the same pattern.

(2) The goal is to survey a minimum of 25 percent of refuge hunters each week and to record data only from those who have completed their day's hunting. This information should be collected during each day of the week and in each area hunted in relative proportion to the hunter effort expended. When the 25 percent goal cannot be achieved, particular care should be taken to collect representative data.

(3) Record the total number of hours the hunters spent hunting on the refuge.

(4) List waterfowl species in decreasing order of numbers bagged. Sample entry: Mallard (61), Pintail (36), Redhead (16), Gadwall (11), Widgeon (6), Coot (4), Canada Goose (3), Green-winged Teal (1).

(5) Record total numbers of waterfowl bagged.

(6) Record total numbers of waterfowl reported knocked down but not recovered.

(7) Total of Columns 5 and 6.

(8) Estimate the total number of hunters who hunted on the refuge during the week, including hunters checked (Column 2).

(9) Kill sample projected to 100 percent. Column 9 = $\frac{\text{Column 8}}{\text{Column 2}}$ x Column 7.

80348-60

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Ruby Lake Months of September to December, 19 64

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Sage Grouse	27,000 acres Upland sage and rabbit brush								50	
California Valley Quail									75	
Gray Partridge									50	
Chukar Partridge									80	First observed in December 1963

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1753
Form NR-3
(June 1945)

BIG GAME

Refuge Ruby Lake Calendar Year 1964

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re-stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
Mule Deer	27,000 Acres Upland sage, meadow & rabbit brush	6	0	0	0	0	0	0	0	0		20	14	1 Buck: 4 Does
		Intermittent wintering herd of an estimated 200 animals												

Remarks:

Reported by Donald E. Lewis

INSTRUCTIONS

Form NR-3 - BIG GAME

(1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.

(2) DENSITY: Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge: once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated total number of young produced on refuge.

(4) REMOVALS: Indicate total number in each category removed during the year.

(5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.

(6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.

(7) TOTAL REFUGE POPULATION: Give the estimated population of <u>each species</u> on the refuge at period of its greatest abundance and also as of Dec. 31.

(8) SEX RATIO: Indicate the percentage of males and females of each species as determined from field observations or through removals.

3-1755
Form NR-5

DISEASE

Refuge Ruby Lake Year 19 64

Botulism None

Lead Poisoning or other Disease None

Period of outbreak _____

Period of heaviest losses _____

Losses:

	Actual Count	Estimated
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Areas affected (location and approximate acreage) _____

Water conditions (average depth of water in sickness areas, reflooding of exposed flats, etc.

Condition of vegetation and invertebrate life _____

Remarks _____

Kind of disease _____

Species affected _____

Number Affected Species	Actual Count	Estimated

Number Recovered _____

Number lost _____

Source of infection _____

Water conditions _____

Food conditions _____

Remarks _____

INT.-DUP., D.C.- 53818-59

NR-6

Bureau of Sport Fisheries and Wildlife

PUBLIC RELATIONS

(See Instructions on Reverse Side)

Refuge Ruby Lake Calendar Year 1964

1. Visits

a. Hunting 400 b. Fishing 8,000 c. Miscellaneous 7,500 d. TOTAL VISITS 15,900

1a. Hunting (on refuge lands)

TYPE	HUNTERS	ACRES	MANAGED BY
Waterfowl	400	8,900	Refuge
Upland Game			
Big Game			
Other			

Number of permanent blinds 0

Man-days of bow hunting included above 0

Estimated man-days of hunting on lands adjacent to refuge 4,500

1b. Fishing (area open to fishing on refuge lands)

TYPE OF AREA	ACRES	MILES
Ponds or Lakes	10,000	
Streams and Shores		1

1c. Miscellaneous Visits

Recreation 3,650 Official 750

Economic Use 3,200 Industrial

2. Refuge Participation (groups)

TYPE OF ORGANIZATION	ON REFUGE		OFF REFUGE	
	NO. OF GROUPS	NUMBER IN GROUPS	NO. Of GROUPS	NUMBER IN GROUPS
Sportsmen Clubs	3	5	12	250
Bird and Garden Clubs	1	3		
Schools				
Service Clubs				
Youth Groups	1	25	26	1,820
Professional-Scientific	5	15	2	100
Religious Groups				
State or Federal Govt.	25	100	10	200
Other				

3. Other Activities

TYPE	NUMBER	TYPE	NUMBER
Press Releases	30	Radio Presentations	1
Newspapers (P.R.'s sent to)	10	Exhibits	0
TV Presentations	1	Est. Exhibit Viewers	0

3-1756
(Rev. 4/63)

INSTRUCTIONS

Item 1: Total of a, b, and c, equal d.

"Visit" - definition. Any person who is on refuge lands or waters during a day or part thereof for the purpose of: hunting, fishing, bird-watching, recreation, business or economic use, official visit, or similar interest. INCLUDE - those who stop within the refuge while traveling on a public highway because of an interest in the area. EXCLUDE - persons engaged in oil or other industry not directly related to the refuge, persons using refuge as most direct route or principal avenue of traffic, and those boating on navigable rivers or the Intercoastal Canal, unless they stop to observe wildlife on the refuge.

Computing visits. Where actual counts are impractical, "sampling" is used with midweek and weekend samples varied by season or weather. A conversion factor of 3.5 (of passengers per car) is used when accurate figures are not available. Each refuge will develop a conversion factor for boats based on range of usage. Count a camper once for each 24-hour period or fraction thereof.

Item 1a: Acres - of refuge open for each type of hunting.

Managed hunts require check in and out of hunters, issuance of permits, or assignment of blinds.

Other - INCLUDE crow, fox, and similar hunting.

Lands adjacent to refuge. Normally considered within 1 mile or less of boundary, unless established sampling procedures cover a wider area. For big game hunting, the distance may be greater.

Item 1b: Acres of streams open to fishing, if practical; otherwise just miles open. Information on "shores" is primarily for coastal fishing.

Item 1c: Recreation. INCLUDE photography, observing wildlife, picnicking, swimming, boating, camping, visitor center use, tours, etc. TOTAL Recreation, Official, and Economic Use visits under Item 1.

Industrial. INCLUDE persons engaged in industry, i.e., oil industry or factories. EXCLUDE these from Item 1.

Item 2: INCLUDE the "On Refuge" groups in Items 1c and 1. In "Off Refuge" column include only those group meetings in which refuge employees actually participate. EXCLUDE these from Items 1c and 1.

Item 3: Exhibits - INCLUDE displays, fairs, parades, and exhibits OFF the refuge; EXCLUDE those ON.

3-1757
Form NR-7
(Rev. June 1960)

(1)

NONAGRIC URAL COLLECTIONS, RECEIPTS, AN LANTINGS

Refuge Ruby Lake Year 19 64

Species	Collections and Receipts (Seeds, rootstocks, trees, shrubs)						Plantings (Marsh - Aquatic - Upland)						
	Amount (Lbs., bus., etc.)	(2) C or R	Date	Method or Source	Cost	(3) Total Amount on Hand	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount and Nature of Propagules	Date	Survival	Cause of Loss
NONE													

(1) Report agronomic farm crops on Form NR-8
(2) C = Collections and R = Receipts
(3) Use "S" to denote surplus

Total acreage planted:
Marsh and aquatic _____
Hedgerows, cover patches _____
Food strips, food patches _____
Forest plantings _____

Remarks: _____

INTERIOR--PORTLAND, OREGON

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Ruby Lake County Elko State Nevada

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Water-fowl Browsing Crops Type and Kind	Total Acreage
			Harvested		Unharvested				
	Acres	Bu./Tons	Acres	Bu./Tons	Acres	Bu./Tons			
Common Rye	0	0	0	0	85	2,100 bu. 1,700 lbs	85	Green brouse. Hay and rye.	85
								Fallow Ag. Land	

No. of Permittees: Agricultural Operations _____ Haying Operations 1 Grazing Operations 5

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
				1. Cattle		4,323.18	6,484.80	18,100
				2. Other Horses		216.00	430.00	20,000
				1. Total Refuge Acreage Under Cultivation				85
Hay - Wild				2. Acreage Cultivated as Service Operation				85

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested - Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested - Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops - Specify the acreage, kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting.

Total Refuge Acreage Under Cultivation - Report total land area devoted to agricultural purposes during the year.

INT.-DUP. SEC., WASH., D.C. 91767

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Ruby Lake County White Pine State Nevada

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Waterfowl Browsing Crops Type and Kind	Total Acreage
			Harvested		Unharvested				
	Acres	Bu./Tons	Acres	Bu./Tons	Acres	Bu./Tons			
NONE									
								Fallow Ag. Land	

No. of Permittees: Agricultural Operations _____ Haying Operations _____ Grazing Operations _____

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
				1. Cattle		2,000.00	3,000.00	8,900
				2. Other		50.00	100.00	7,000
				1. Total Refuge Acreage Under Cultivation				0
Hay - Wild				2. Acreage Cultivated as Service Operation				0

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested - Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested - Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops - Specify the acreage, kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting.

Total Refuge Acreage Under Cultivation - Report total land area devoted to agricultural purposes during the year.

INT.-DUP. SEC., WASH., D.C. 91767

3-1570
NR-8a

REFUGE GRAIN REPORT

Refuge Ruby Lake Months of September through December, 1964

(1) Variety*	(2) On Hand Beginning of Period	(3) Received During Period	(4) Total	(5) Grain Disposed of				(6) On Hand End of Period	(7) Proposed or Suitable Use*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Common Rye	0	5800 lb	5800 lb	0	4900 lb	0	4900 lb	900 lb	900 lb	0	0
Crested Wheat	30 bu	0	30 bu	0	0	0	0	30 bu	30 bu	0	0
Elevator Screenings	0	6060 lb	6060 lb	0	0	3520 lb	3520 lb	2540 lb	0	2540 lb	0

(8) Indicate shipping or collection points Elko, Nevada

(9) Grain is stored at CCC Camp and Headquarters

(10) Remarks 5800 lbs. Common Rye Seed and 6060 lbs. Elevator Sweepings purchased from Globe Feed and Seed, Twin Falls, Idaho.

*See instructions on back.

16-61482-1

NR-8a

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

(1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR–9.

(3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.

(4) A total of columns 2 and 3.

(6) Column 4 less column 5.

(7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.

(8) Nearest railroad station for shipping and receiving.

(9) Where stored on refuge: "Headquarters granary," etc.

(10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

16—61482-1 U. S. GOVERNMENT PRINTING OFFICE

3-1761
Form NR-11

TIMBER REMOVAL

Refuge Ruby Lake Year 1964

Permittee	Permit No.	Unit or Location	Acreage	No. of Units Expressed in B. F., ties, etc.	Rate of Charge	Total Income	Reservations and/or Diameter Limits	Species Cut
NONE								

Total acreage cut over..... Total income.....

No. of units removed B. F..... Method of slash disposal.....

Cords.....

Ties.....

.....

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PERSTICIDE APPLICATION

Refuge: Ruby Lake

Proposal Number:

Reporting Year: 1964

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
7/8-7/15	Thistles, mustard	Dikes & roadsides	302	2-4-D Amine	75 gal.	2 lbs A.E./A	6 oz. spreader activator per acre	Hanson Brod-Jet

10. Summary of results (continue on reverse side, if necessary)

85%

An apparent kill was achieved on broadleaf vegetation with no observed detrimental effects to wildlife

KSH

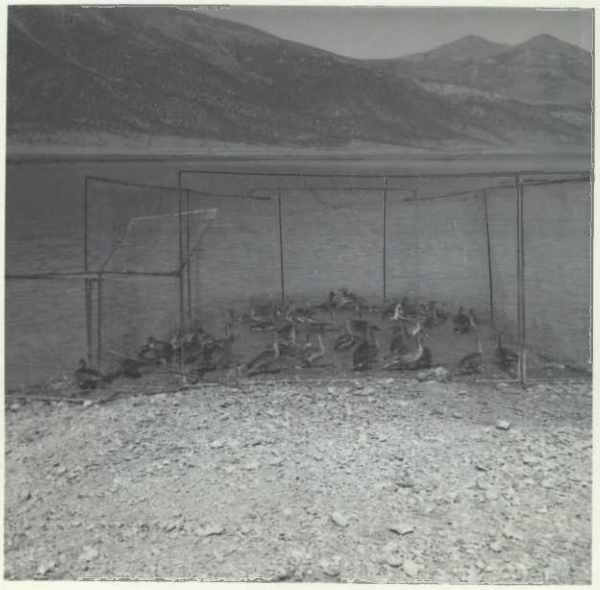
35500

Lewis and Larochelle begin annual
Snow Survey trek.

Behind that brush is Mr. Jack
Lemback, Refuge trapper.

A portion of the Pintail quota
caught in the South Sump.

This is a scene of the past that
occurred last winter when the
headquarters domestic water supply
became solid.



Finishing touches to the new headquarters water supply. No freeze-up so far this winter.

Mr. Carl Longenecker, Maintenance-man II, is presented with his 10-year Service Pin.

Coot nest. These birds very systematically spaced their nests through the East Sump.

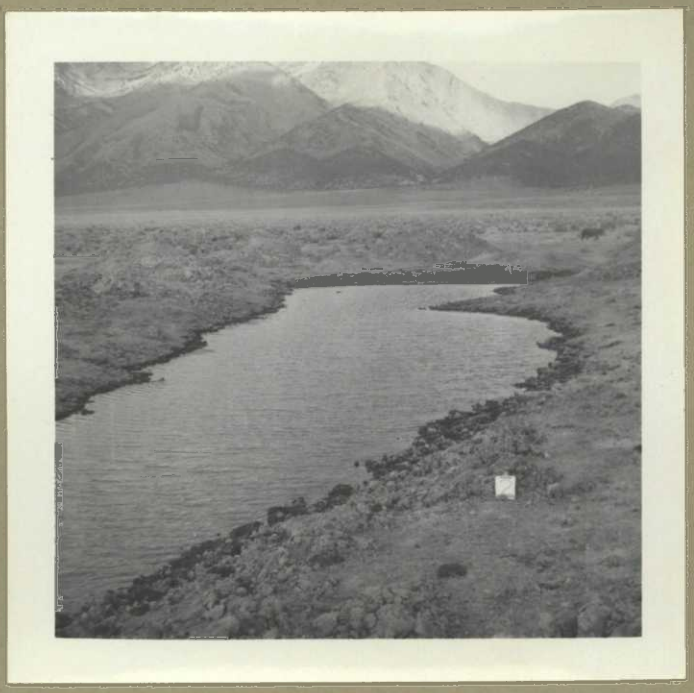
A colony of approximately 400 Eared Grebes also nested in the East Sump.

Have conveniences - will travel.
These toilets were donated by the
Elko Sportsman's Club.

Making the conveniences comfortable.

Spring-head Development Program.
No work of this type has been accomplished until 1964.

For many years cattle have trampled existing spring-heads.



Siltation run-off has, in some cases, completely covered these valuable water sources.

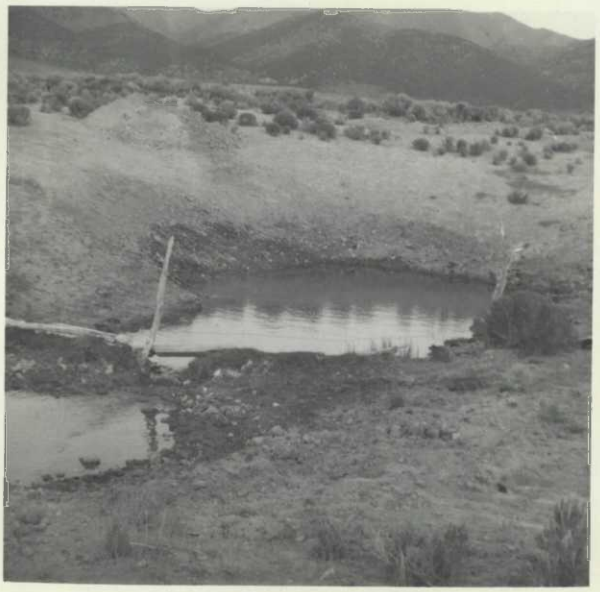
A complete spring-head survey has been conducted, revealing 136 springs.

Approximately 90 of these spring-heads and their channels to the marsh need renovation.

Spring flow is the only source of refuge water.

Water control structure at outlet of spring-head. The preceeding photographs have shown a portion of the Spring Development Program.

33 springs have received treatment to date. Piles of silt will be worked to grade, planted to crested wheat grass, and fenced for protection.



Four refuge directional signs were routed and refinished.

Three major gravel jobs were completed in 1964.

Old "CCC" buildings just cannot stand when wind gusts reach 70-80 m.p.h. The tractor was not damaged. Roofing material was scattered for 200 yds. Not much remained to salvage.

Construction of cattle guard on
boat landing access road.

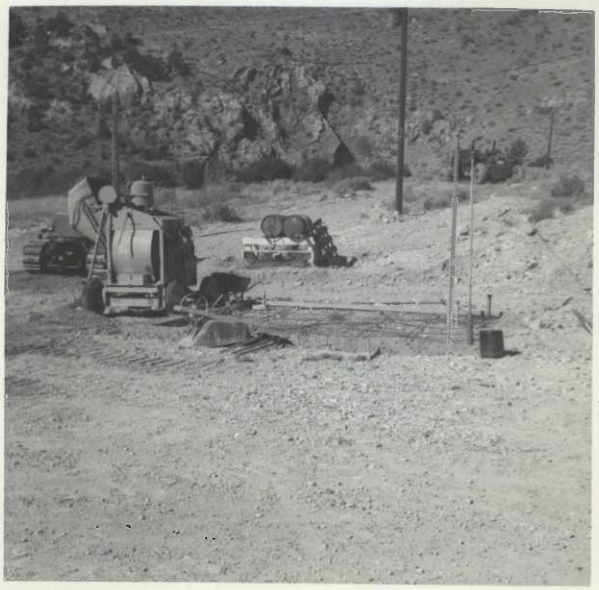
A very scenic and peaceful view
at refuge headquarters.

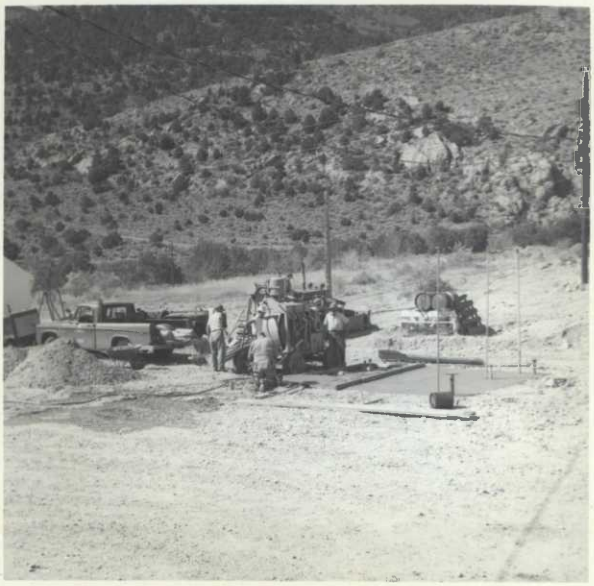
Bass tagging operations with the use of an AC-DC electro-fishing device. The machine was experimentally tried in weedy areas to capture bass. It was not too successful.

A muskrat burrow started this leak in the dike. It was very fortunate that it was discovered before extensive damage resulted in the loss of water in the North Hatchery Rearing Ponds.

A small ridge of clay is all that saved the impounded water. The refuge TD-18A filled the gap.

Construction of foundation for electric gas and diesel pumps. The platform covers a 500 gal. tank and two 1,000 gal. tanks.





Completion of a more convenient way to obtain fuel. We all said a few sentimental words in remembrance to the "old hand pump".

Austin-Western 99-H Motor Grader obtained from surplus.

What else are you going to do when garages start to fly? Windy gusts reached at least 80 m.p.h.

Removed South Boundary and minnow signs from old road, refinished both and placed them along the new road.